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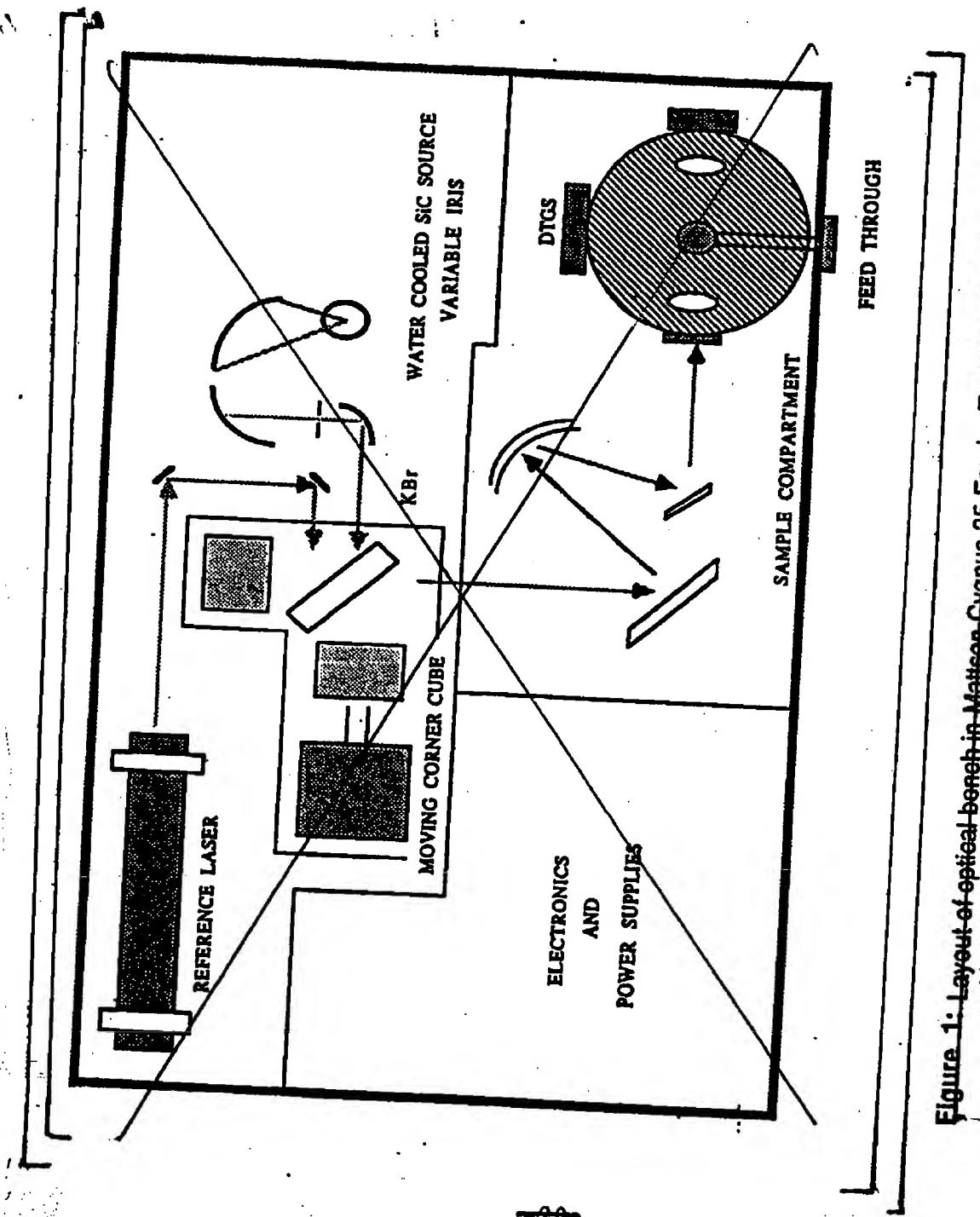
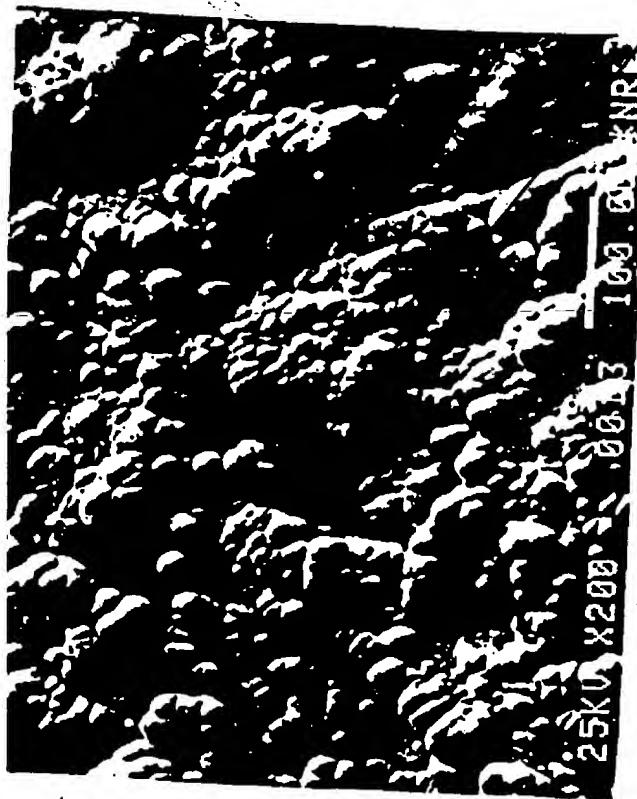


Figure 1: Layout of optical bench in Mattson Cygnus 25 Fourier-Transfer Spectrophotometer with Labsphere Integrating sphere accessory installed.

↑ Fig. 2c  
↓ Fig. 2d↑ Fig. 2a  
↓ Fig. 2b

Figures 2a, 2b, 2c, and 2d are scanning electron microscope pictures of the latex sphere 400 nm coating at 200x (Fig. 2a) and 500x (Fig. 2b). The latex coating used in the NRL sphere is shown at 100x magnification (Fig. 2c) and 2000x magnification (Fig. 2d).

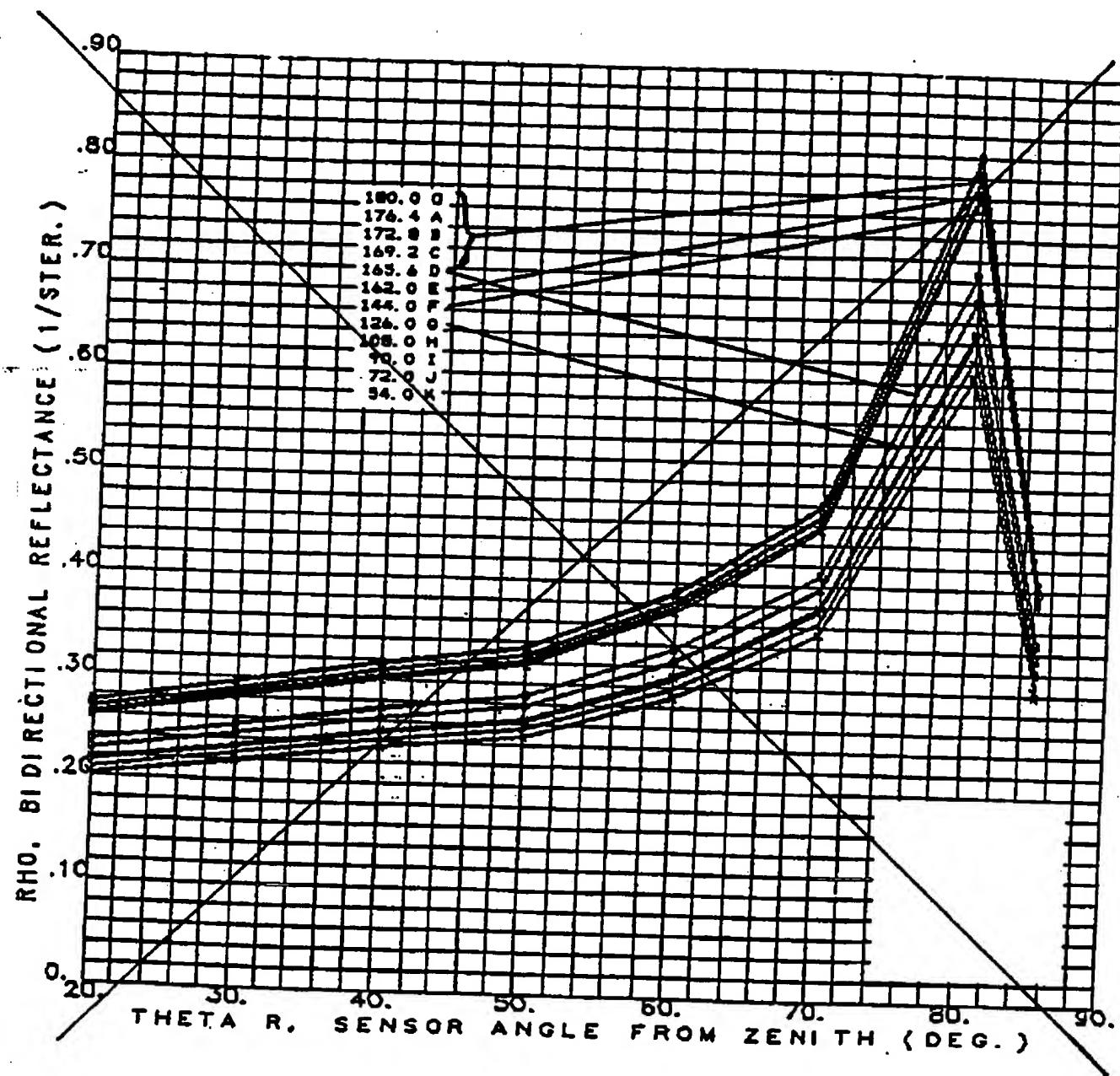
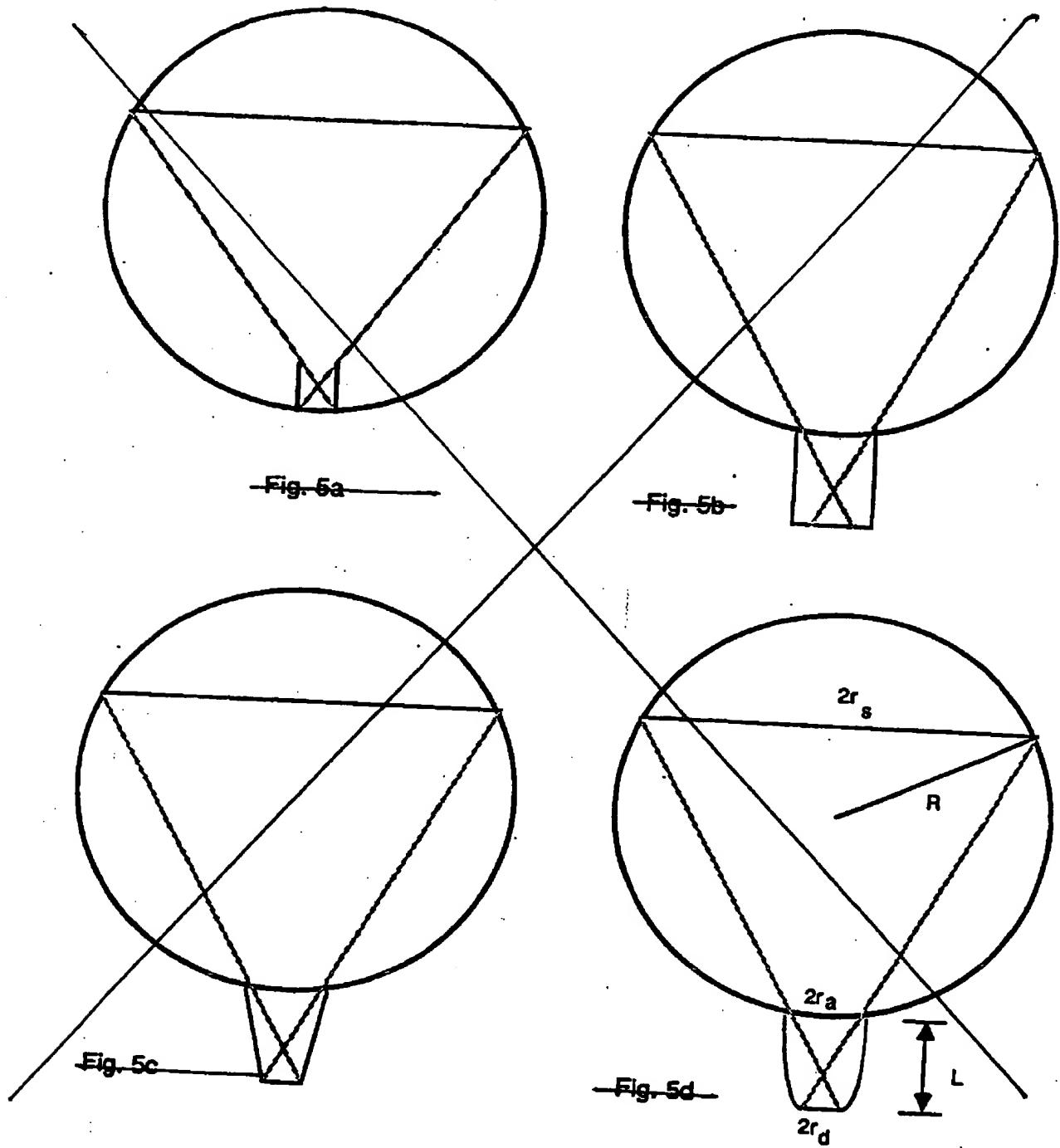


Figure 4: Bidirectional reflectance data for LabSphere 400 micro-inch diffuse gold coating. The data shown was measured at an incidence angle of 20 degrees, a wavelength of 10.6 microns, and a variety of angles in different azimuthal planes ranging from the plane of incidence (top curve) to 126 degrees out of the plane of incidence (bottom curve).



**Figure 5:** Detector optics coupling schemes: a) baffle, b) estimator, c) reflecting cone, and d) Compound Elliptic Concentrator (CEC).

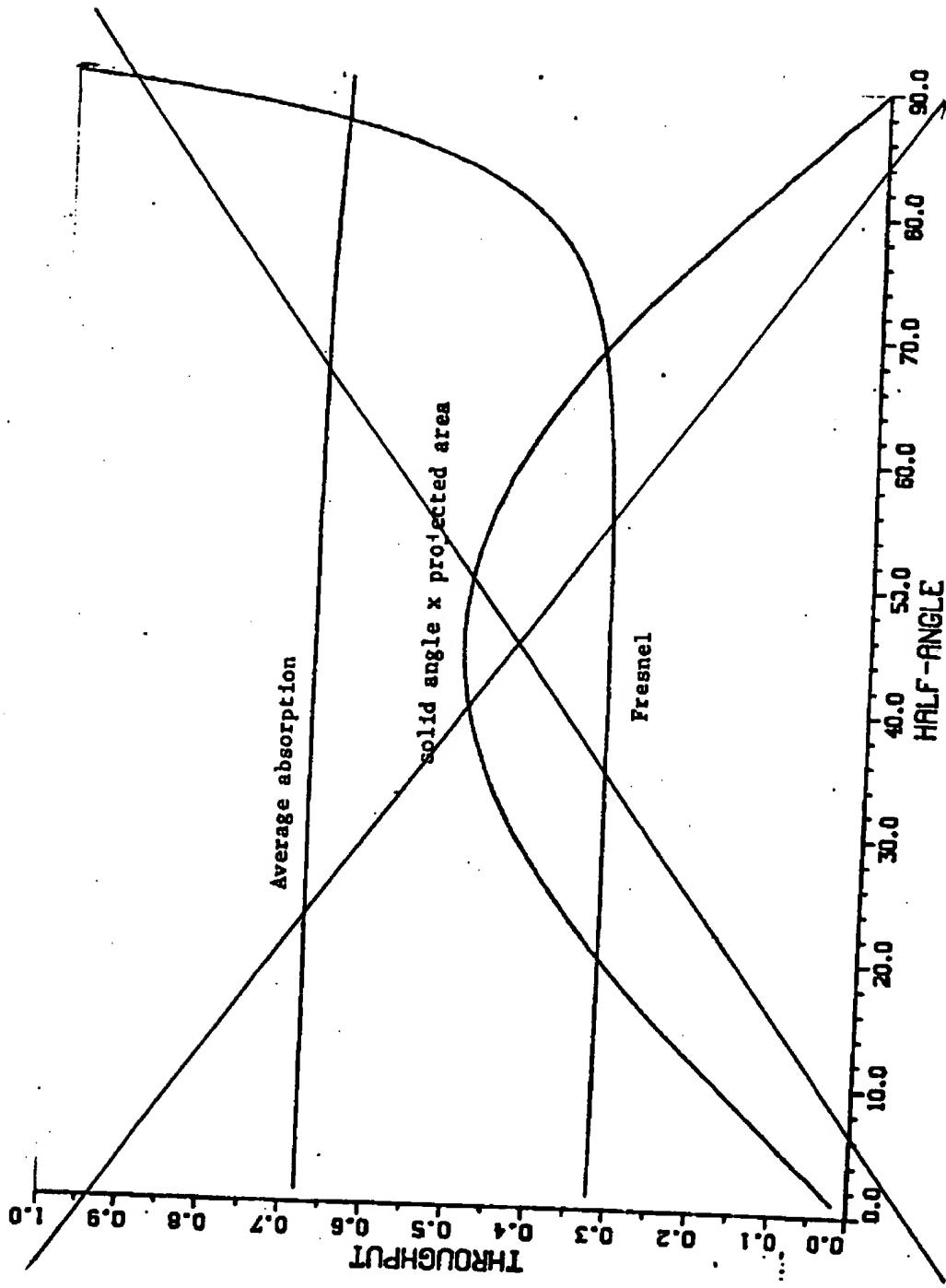


Figure 6: Average absorption vs. cone-half-angle for Lambertian illumination of a Regate detector at 10 microns. The high Fresnel reflections losses at large angles do not decrease the average absorption significantly due to the projected area in the weighting factors.

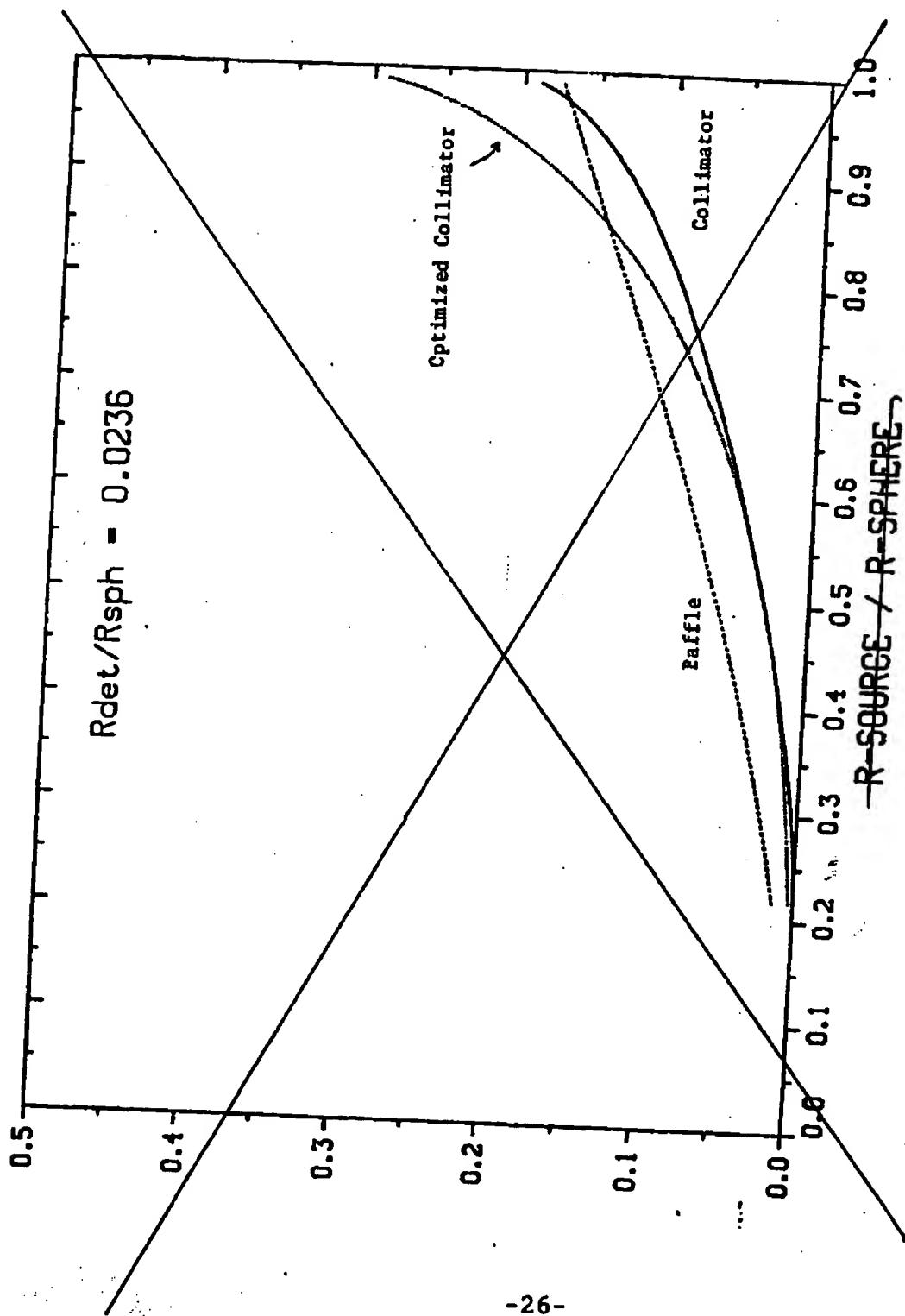
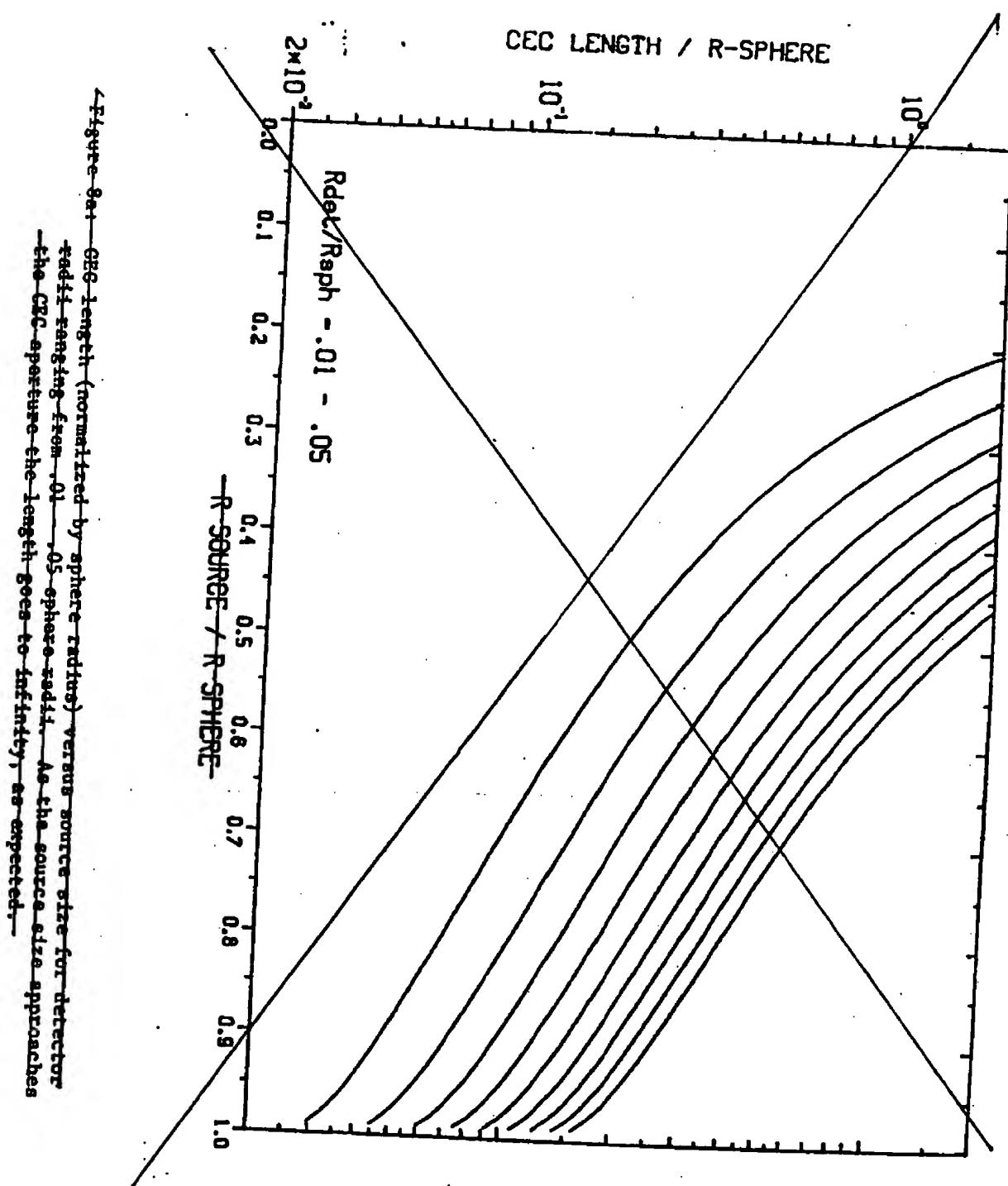
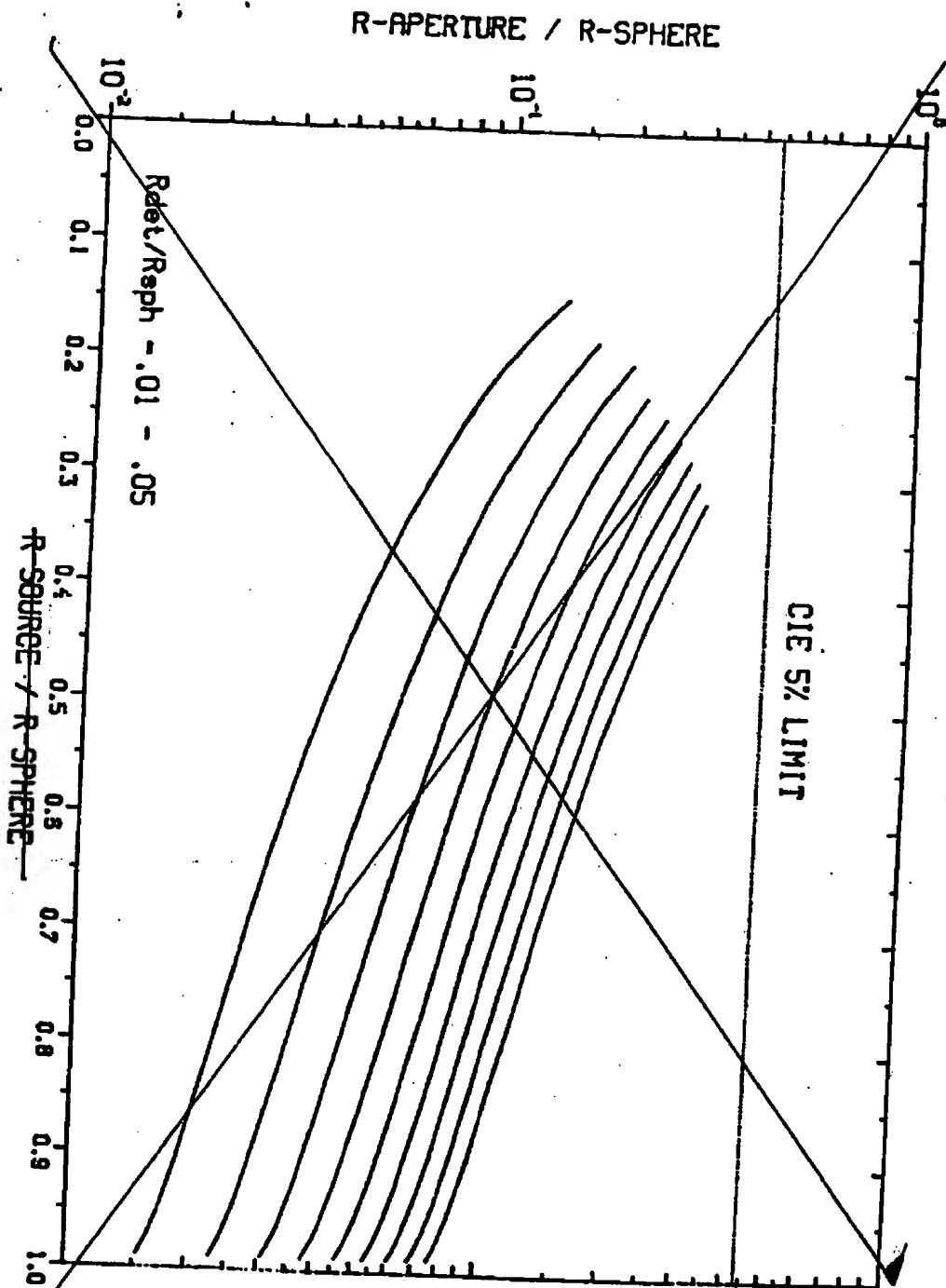


Figure 7: Integrating-sphere-detector-optics-throughput (normalized by CRC throughput) vs. source-radius-divided-by-sphere-radius. For a source-radius-of-0.97, the CRC is over-five-times-more-efficient-at-collecting-radiation-than-the-optimized-collimator.





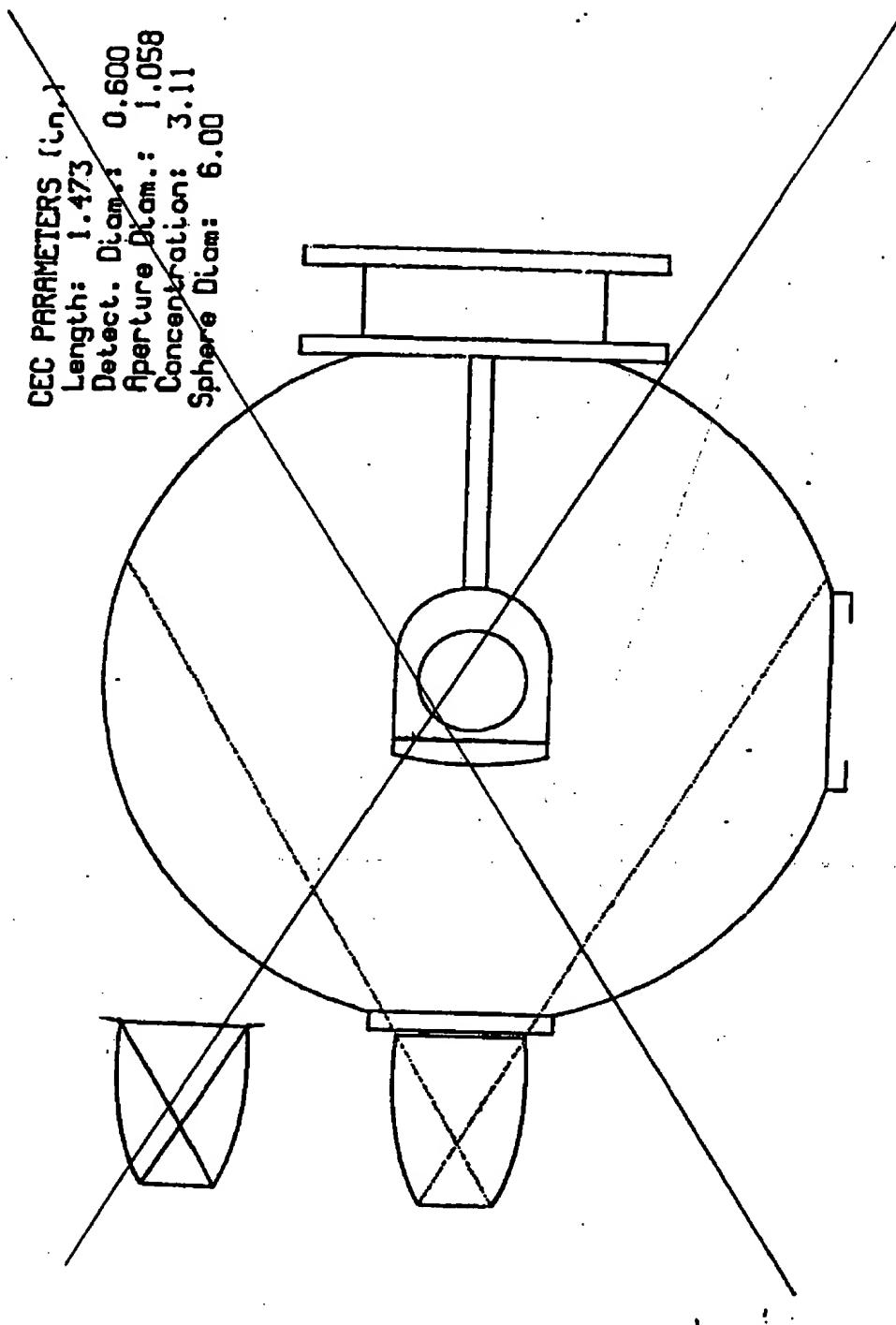


Figure 9: Effect of refraction compensation on the CEC length and concentration. The upper CEC was designed for the same source, spheres, and detector radius as the lower, however, no cover window over the detector was assumed. The concentration and length for the upper CEC are 3.99 and 1.399 respectively, or about 4-5% less than the refraction compensated 656.

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